

REMARKS/ARGUMENTS

This application has been carefully reviewed in light of the Final Office Action dated November 17, 2009. A request for continued examination (RCE) and one month extension of time is enclosed. Claims 1, 2, 7 and 9 remain in this application. Claim 1 is the independent Claim. Claims 1 have been amended. Claims 3-6 and 10 have been canceled without prejudice. It is believed that no new matter is involved in the amendments or arguments presented herein. Reexamination and reconsideration of the application, as amended, are respectfully requested.

The present application is generally directed to a silicon based thin film solar cell including a silicon based low refractive index layer, a silicon based interface layer and a back electrode on the backside of a photoelectric conversion layer. (Applicant's specification, at FIG. 1).

TELEPHONE I NTERVIEW SUMMARY

A telephone interview was conducted on February 24, 2010 between the Examiner and applicant's representative Robert Wu. Applicant thanks the Examiner for the courtesies extended during the interview. Applicant argued that the amended claim 1 in the after final amendment dated January 19, 2010 should be entered at least for the purposes of placing the claims in a better form for appeal since the subject matter of claim 10, which depends directly on claim 3, was previously of record such that not new issues were involved (as also noted in the amendment). Furthermore, arguments directed to the combination of claims 1, 3 and 10 previously set forth on the record must also be considered. In response, the Examiner agreed that a new supplemental Advisory Action addressing the arguments with respect to the combination of claims 1, 3 and 10 would be issued.

CLAIM REJECTIONS UNDER 35 U.S.C. § 103

Claims 1-7, 9 and 10 stand rejected under 35 U.S.C. § 103(a) as being obvious over Watanabe (US 4,781,765). Applicant respectfully traverses this rejection and amends claim 1 to clearly distinguish over all references of record. Claim 1 is amended to include the subject matter of claim 10, which depends from claim 3, as well as the subject matter of dependent claims 4 and 6. Claim 1 reads as follows:

A silicon based thin film solar cell, wherein a conductive type silicon based low refractive index layer, a silicon based interface layer, and a back electrode are disposed and contact one another in this order on a backside of a photoelectric conversion layer observed from a light incident side, wherein the silicon based interface layer comprises a crystalline silicon component in the layer, wherein the silicon based low refractive index layer comprises a crystalline silicon component in the layer, wherein a most abundantly existing constituent element, excluding silicon, in the silicon based low refractive index layer is oxygen, which is present in an amount not less than 25 atomic %, and wherein the silicon based low refractive index layer has a thickness of not less than 300 angstroms.

Applicant respectfully submits that claim 1 is not obvious because the cited references fail to teach or suggest that “wherein the silicon based low refractive index layer comprises a crystalline silicon component in the layer, wherein a most abundantly existing constituent element, excluding silicon, in the silicon based low refractive index layer is oxygen, which is present in an amount not less than 25 atomic %, and wherein the silicon based low refractive index layer has a thickness of not less than 300 angstroms.” In this manner, the present invention provides a resistance in a thickness direction of the silicon based low refractive index layer that is reduced, as well as a contact resistance with a back electrode that is kept

small, due to the crystalline silicon components of the layers (paragraphs 0017 and 0018).

Nakamura is cited for teaching or suggesting that the crystalline silicon component in the silicon based low refractive index layer (and/or in the silicon based interface layer) is obvious. However, Nakamura merely discloses the merits of having both amorphous and crystalline phases in a photoelectric conversion layer (i-type layer) but is silent as to the conductivity layers (p-type layer or n-type layer). Furthermore, the present invention requires oxygen to be the most abundant element in the whole thin film solar cell. Applicant submits that Watanabe fails to disclose or suggest this feature. Page 3 of the Office Action cites Watanabe at column 7, lines 14-18 for teaching the first type sub-layer containing oxygen at less than 50%. However, since the amounts of other elements are not disclosed for the sub-layer or any of the other layers, it is not possible to determine which element is the most abundant within the photovoltaic device.

In view of the foregoing, it is respectfully submitted that the combination of Watanabe and Nakamura cannot render claims 1, 2, 7 and 9 obvious since they fail to teach or suggest each and every claim limitation. Accordingly, withdrawal of the rejections are respectfully requested.

In view of the foregoing, it is respectfully submitted that the application is in condition for allowance. Reexamination and reconsideration of the application, as amended, are requested.

If for any reason the Examiner finds the application other than in condition for allowance, the Examiner is requested to call the undersigned attorney at the Los Angeles, California telephone number (310)785-4600 to discuss the steps necessary for placing the application in condition for allowance.

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If there are any fees due in connection with the filing of this response, please charge the fees to our Deposit Account No. 50-1314.

Respectfully submitted,
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